(No Model.)

W. L. SHEPARD.

BACK PRESSURE VALVE.

No. 455,853. Patented July 14, 1891.

Fig. 1.

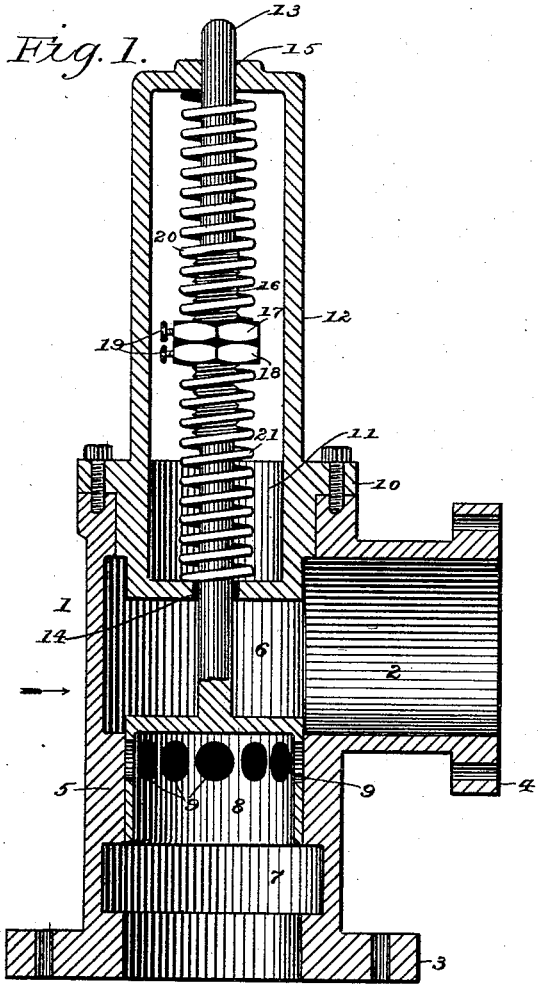
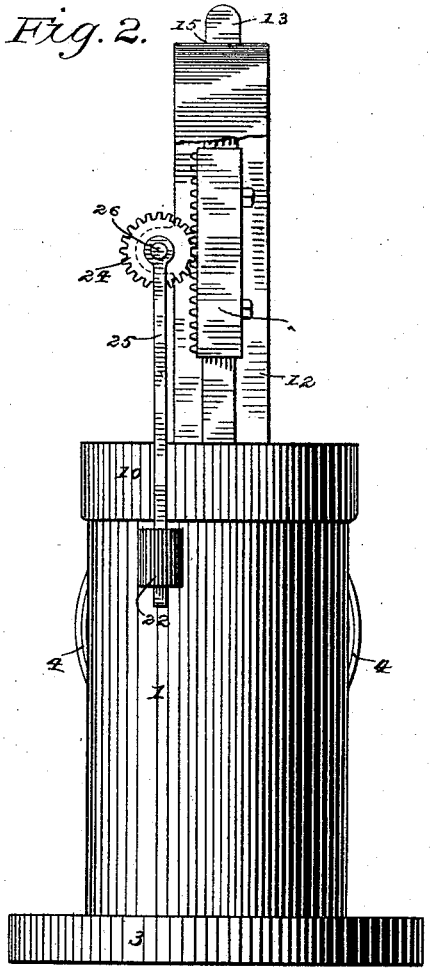


Fig. 2.



WITNESSES

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WILBUR L. SHEPARD, OF WEST HARTFORD, CONNECTICUT.

BACK-PRESSURE VALVE.

SPECIFICATION forming part of Letters Patent No. 455,853, dated July 14, 1891.

Application filed February 28, 1891. Serial No. 383,243. (No model.)

To all whom it may concern:

Be it known that I, WILBUR L. SHEPARD, of West Hartford, (Elmwood,) county of Hartford, and State of Connecticut, have invented certain new and useful Improvements in Back-Pressure Valves, which improvements are described in the following specification and are illustrated by the accompanying drawings.

It is the object of my invention to produce a back-pressure valve which will operate without hammering or excessive wear when applied to exhaust-steam pipes. To accomplish this object I use a piston-valve in connection with a stabilizing device of peculiar construction, whereby the valve is normally closed, but is permitted to be opened by direct pressure of a predetermined tension.

The best mode in which I have contemplated applying the principle of my invention is shown in the drawings, in which—

Figure 1 is a sectional view of a back-pressure valve which is constructed in accordance with my invention, including the stabilizing device. Fig. 2 is an elevation of the same, viewed in the direction of the arrow in Fig. 1 and showing the stabilizing device in a modified form.

In the views, 1 denotes the valve-casing, which is a hollow iron casting having its main portion of general cylindrical form and having at one side a tubular extension 2. Casing 1 is provided with a terminal flange 3 for the formation of a flange-joint with an abutting section of steam-pipe, which is not shown in the drawings, but may be understood to be a portion of the exhaust-pipe of a steam-engine. In like manner extension 2 is provided with a flange 4 for connection with a branch which is to lead away whatever steam passes the valve. In the middle portion of casing 1 is formed, in the usual manner, a piston-valve-seat 5, whose aperture is somewhat smaller than the chambers 6 and 7, which are located, respectively, upon opposite sides of the valve, as seen in Fig. 1. In seat 5 plays the reciprocating piston 8, which is hollow, open at one end toward chamber 7, closed at the other end toward chamber 6, and provided with side ports 9. In the top of casing 1 is a cylinder-head 10, having an external chamber 11 and bracket 12. The stem 13 of piston 8 emerges from chamber 6 through a hole or stuffing-box 14 in the middle of head 10 and plays through a guiding-hole 15 in bracket 12. This stem is provided with a screw-thread 16 midway between holes 14 and 15, and with nuts 17 and 18 thereon, which have nut-locks 19. Surrounding stem 13 are two helical springs 20 and 21, the former abutting against bracket 12 and nut 17, and the latter abutting against head 10 and nut 18. By manipulating nuts 17 and 18, springs 20 and 21 are set at such tension as to hold the described piston-valve closed as against steam-pressure of any predetermined tension in chamber 7. Excess of pressure moves piston 8 until ports 9 are to a greater or less extent openly exposed in chamber 6, and then the excessive pressure is relieved and the valve resumes its closed position. (Seen in Fig. 1.)

In the operation of the invention it is to be observed that the described valve may be set in any desired position, and not necessarily in the usual vertical position which is indicated in the drawings, and also that the opposing springs, being so set by means of the adjustable nuts 17 and 18 as to hold the valve closed in the normal position indicated as against any desired or predetermined tension in chamber 7, will present to every movement of the valve a resistance which increases according to the departure of the valve from that position. It is obvious that the last-mentioned peculiarity of operation may be produced by a weight 22 applied to stem 13 by means of an intermediate rack 23, which is attached to that stem, a gear-wheel 24, meshing with the rack, and a lever-arm 25, which is keyed to the shaft 26 of that gear-wheel and carries the weight 22, set in an adjustable position thereon, as illustrated in Fig. 2.

Such being the construction and operation of my invention, I claim as new and desire to secure by Letters Patent—

1. A cylindrical valve-casing having a lateral outlet, a piston-valve within the casing, a cylinder-head fitted to one end of the casing, and a valve-stem working through the cylinder-head, in combination with external

spring mechanism regulating the action of the valve, substantially as and for the purpose specified.

2. In a back-pressure valve, a valve-casing and a valve therein, having a valve-stem working through the casing, in combination with external regulating mechanism having an adjustable engagement with the valve-stem, substantially as and for the purpose specified.

In testimony whereof I hereunto set my name in the presence of two witnesses:

WILBUR L. SHEPARD.

Witnesses:
RICHARD H. MATHER,
WILLARD EDDY.